Exercise Apparatus

The present invention relates to exercise apparatus and in particular but not exclusively to an adaptable exercise apparatus assembly that can be orientated in a number of positions so that users can exercise using the apparatus assembly in accordance with their individual requirements.

Various types of exercise apparatus are know such as that described in US6,120,424, which describes a body building apparatus having two cylindrical bars connected at opposing ends by two flexible elastically extendible side members. The apparatus is used to perform isotonic or isometric exercises by having one of the cylindrical bars in a position such that a person can repetitively exert tension against the resistance of the elastically extensible side members by pulling the other cylindrical bar. The isotonic or isometric exercise is performed as a result of the movement of one of the cylindrical bars relative to the other by stretching the elastic side members.

An isometric type exercise apparatus is described in US4,417,727, which describes a pair of spaced part-parallel hand grips having bars holding the hand grips in place. At least one of the hand grips can be orientated with respect of the other so that various exercises can be formed. However, this apparatus only allows for a limited number of exercises to be performed because the bars can be orientated with respect to one another only in a limited number of positions. Consequently, many muscle groups of the body could not be exercised.

The present invention seeks to overcome the problems associated with the prior art, for example, in the case of isotonic or isometric exercise, where strain may be placed on an individual because they are actually pulling against a predefined resistance with the consequence that an individual may be forced to exercise beyond his or her physical capacities. Also, unlike known types of apparatus, the apparatus of the present invention is particularly adaptable and allows for a broad range of exercises to be performed due to the fact that the apparatus can accommodate being positioned in a number of orientations. This allows not only for a number of different exercises to be carried out at the same time

but it also provides a particularly versatile form of apparatus for individuals to use due to the fact that they are exerting effort against a defined part of the apparatus, therefore reducing the risk of injury to the person when exercising.

According to the present invention, there is provided an exercise apparatus which, when the apparatus is assembled, allows an individual using said apparatus to apply a force against a part of the apparatus that remains static during the application of said force, characterised in that the apparatus comprises a series of elongate sections, said sections being releasably connectable to one another by way of connecting joints which allow for the sections to be connected to one another and to be positioned in various orientations relative to one another as required by the individual using the apparatus, so allowing said individual to perform exercises as required.

It is envisaged that releasable means involves screw mechanisms or quick release catches associated with said joints such that sections of the apparatus can be orientated quickly and as conveniently as possible.

The elongate sections may be joined end to end via a removable insert, preferably releasably fastened to one another.

Preferably, the exercise apparatus comprises an upright section, supported by a base section wherein the upright is releasably secured to at least one arm section extending substantially at right angles to the axis of the upright, said arm, when secured in position, providing a surface against which an individual using the apparatus can push. It is envisaged that the upright is supported by a joint, which allows for rotation of the upright about its vertical axis. This allows an individual not only to exert a force against a stationary bar, but when the bar is rotated, it allows an individual to exercise other muscle groups because the arm has moved to a different position as a result of the bar having been moved or rotated.

Preferably, at least one section of the apparatus can be oriented relative to a first section such that a new exercise can be carried out as defined by the new relative positioning of the elongate sections by a collar fastening means.

The collar fastening means is preferably arranged and configured to slide over an elongate sections, the collar preferably including locking means to removably retain the collar portion at a desired position on the elongate section. The locking means is preferably at least one grub screw, or alternatively may be at least one connecting pin which locates within apertures on the elongate section. The connecting pins may be moveable against a resilient biasing means, such that the collar fastening means may be slid along the elongate section and the location on the elongate section selected. The collar fastening means preferably includes a receiving portion into which a further elongate section is received. Connector pins are preferably provided that locate within apertures on the elongate sections, thereby retaining the elongate section connected to said collar fastening means.

The apparatus is beneficially modular such that the use of a plurality of collar fastening means and elongate sections provides numerous exercise orientations. In an alternative embodiment, at least one section of the apparatus may comprise at least two telescoping parts, one part being slidable within the other so that the length of the section can be adjusted to be as long or as short as required by an individual. It is envisaged that the telescoping mechanism can operate via a ratchet mechanism whereby one section is pulled out from another, or alternatively, the sections can be slidable one within another but once a particular position has been reached, a fixing member such as a bolt or screw can be pushed through aligned apertures within the body of each of the telescoping sections, so that telescoping sections can be held in a particular orientation relative to one another.

The apparatus preferably further comprises joining means to releasably connect two elongate sections at angles adjustable relative to each other. The joining means preferably comprises of at least one disc, arranged and configured to be removably attached adjacent the longitudinal length of the elongate section, said disc containing a plurality of apertures such that a second elongate section may be removably connected to the disc. The discs are preferably connected to an elongate section via at least one connecting pin.

It is envisaged that the apparatus of the invention may be supported on a supporting stand, for example, the apparatus can be push fitted into resilient apertures in a base member that acts to hold sections of the apparatus forming the uprights in position. Alternatively, the

apparatus can be secured to a structure that does not form part of the apparatus assembly, for example a suitably constructed wall attachment, a chair, stool or a bed by means of a clamp attached to the exercise apparatus which can be used to secure the apparatus to said supporting structure. The clamp may be a simple C-clamp or alternatively a bolt mechanism that passes through parts of the structure of the exercise apparatus, as well as part of the supporting structure to which the apparatus is attached. This arrangement provides not only a secure means of holding the apparatus in position when a person is exercising but also allows for a degree of versatility for an individual using the apparatus in that they can attach the apparatus to a supporting structure that happens to be present in the environment where the exercising takes place. In particular, the exercise apparatus can be attached to part of a bed so that the apparatus is secured in a position such that persons who are incapacitated may use the apparatus while they are still in bed. This is particularly useful where individuals that may have been involved in an accident or who are partially paralysed and have to remain in a particular position, because they can still have the facility to exercise, because of the fact that the apparatus is versatile enough to be positioned so that it can be used by that individual.

It is also envisaged that a disc may be rotationally mounted on an elongate section, including gripping means such that a user can rotate the disc. The gripping means may be one or more arms mounted on the disc, which an individual can apply a force to once the disc and arm are locked in a required position for a particular exercise. Electricity is preferably passed through the disc, and opposing permanent magnets are preferably mounted adjacent opposing faces of the disc. This results in the appearance of Eddy currents, providing resistance against rotation of the disc, providing a further exercise for a user.

It is further envisaged that a strain gauge may be incorporated in the apparatus to monitor the effort that a person is exerting against a proportion of the apparatus . The strain gauge may also be in communication with an alarm which, should an individual be working outside set parameters defined for individual, the alarm will be activated to warn the individual or a third party that the individual is exercising within possibly dangerous limits

for their individual capacity. The alarm may well be by way of an audible or visual alarm or a combination of the two.

Preferably, the apparatus is provided in the form of a kit where there are, for example, four long sections of approximately one metre in length, which can provide the uprights for the apparatus. Shorter sections of approximately 0.6 metres may be provided as cross members and typically there will be six of these in basic kit for the exercise apparatus assembly. There will be joint collar fastening means for securing the uprights and cross members together. The basic kit can be used to construct an exercise apparatus which will enable an individual to exercise most, if not all, of the major muscle groups of the body. However, the exercise apparatus is versatile enough so that additional elements can be purchased and added to the basic kit if further exercises are to be performed, or if a number of individuals are to use the apparatus at the same time.

Embodiments of the invention will now be described by way of example only, with reference to and as illustrated in the accompanying figures.

Figure 1 shows a schematic cross sectional view of two elongate sections and joining mechanism according to an exemplary embodiment of the present invention.

Figure 2 shows a schematic cross sectional side view of the slider mechanism according to an exemplary embodiment of the present invention.

Figure 3 shows a schematic cross sectional side view of the slider mechanism according to a further exemplary embodiment of the present invention.

Figure 4 shows a schematic side view of an elongate section angle adjuster according to an exemplary embodiment of the present invention.

Figure 5 is a schematic side view of a further exemplary embodiment of the exercise apparatus according to the present invention.

Figure 6 is a schematic perspective view of a further exemplary embodiment of an exercise apparatus according to the present invention.

Figure 7 is a schematic perspective view of a further exemplary embodiment of the exercise apparatus according to the present invention.

Figure 8 shows an enlarged view of extension mechanism for a section of the apparatus according to an exemplary embodiment of the invention.

Figure 9 is a schematic diagram a further embodiment of the invention that allows for rotational movement of the exercise apparatus.

Figure 10 is a schematic arrangement allowing for rotational exercises in which the apparatus is at an orientation at 90° from that shown in Figure 6.

Figure 11 is a schematic diagram of an end view of a further embodiment of the present invention allowing for rotational exercises.

Figure 12 is a schematic diagram of a perspective view of a further embodiment of the invention.

In a preferred embodiment, the kit is provided in individual sections to be assembled. Referring to Figure 1, two primary elongate sections 102 of the apparatus are provided of approximately 1m in length each, and being cylindrical in shape. However, square sections are also envisaged. They must be releasably connectable to each other. In one embodiment, a second primary elongate section of slightly differing diameter may be provided such that a telescopic arrangement is utilised, however, in the preferred embodiment, primary elongate section have the same diameter, of 6cm for example. Apertures 104 are drilled substantially at right angles to the primary elongate section at a location proximal to either end of the primary elongate section. The preferred distance is 1cm from each end, of diameters approximately 6mm. Each primary elongate section therefore has two apertures, diametrically opposite each other through the cylinder wall. A

shorter connecting elongate section 106 is provided of a smaller diameter than the primary elongate section 102. This allows the connecting elongate section 106 to slot into the inner diameters of the primary elongate section 102. Apertures 108 are provided on diametrically opposing parts of the connecting elongate section 106, of the same diameter as those on the primary elongate section 102. The primary elongate section 102 may then be connected by aligning the apertures on the connecting elongate section 106 and primary elongate section 102, and a grub screw 110 passed through the aligned apertures. This joins the primary elongate section 102 and inner cylinder. Grub screws 110 are also positioned through the second primary elongate section 102 and corresponding aperture on the connecting elongate section 106, resulting in the two sections being releasably attached. Threads are provided within the connecting elongate section 106 such that the grub screws can be engaged. The fastening mechanism is configured such that the heads of the grub screws 110 do not protrude beyond the outer surface of the primary elongate sections 102.

An alternative mechanism of joining two primary elongate sections 102 is using a telescopic arrangement, whereby one of the primary elongate section is of a smaller diameter than the other, and the smaller diameter elongate section slides within the larger diameter elongate section. A screw mechanism may be used to clamp the rods at the desired location. In order that angular joints can be created, the modular components may be removably and adjustably attached to one another via a simple collar which slides over the outer faces of the elongate section. This collar may be clamped by a bolt or screw being tightened through the collar against the elongate section, thereby clamping the collar in position. A further elongate section may then be removably attached to the collar as described in more detail later.

In the simplest embodiment, the slider 112 is essentially a collar 114 that is a cylindrical type structure (of cylindrical or square cross section) having an inner diameter greater than the outer diameter of the primary elongate section 102. This allows free sliding movement along the primary elongate section. Referring to figure 2 there is a cross-sectional schematic diagram of the primary elongate section 102 and the slider arrangement 112 is shown there. There are at least two apertures in each collar 112 such that a joining pin 118 may be inserted through both the collar 112 and the primary elongate section 102, having

the effect that the slider 112 is retained in position. Within the collar 114 are circular apertures 116, that, in a certain configuration line up with corresponding apertures 104 within the primary elongate section 102. In an alternative arrangement, as is shown in Figure 3, a further cylindrical portion extends at substantially 90° from the longitudinal length of the primary elongate section. This provides a guide into which the working rod 122 may slot. This cylindrical portion therefore has an inner diameter slightly greater than the outer diameter of the working rod. A further guide may be provided for increased support extending at substantially 90° from the longitudinal length of the primary elongate section, having an outer diameter slightly less than the inner diameter of the working rod.

Referring back to Figure 2, the joining pins 118 are slidably engagable with the aperture 116 within the collar 114 and the primary elongate section 102, such that the working rod 122 is held at the desired position on the primary elongate section 102. Connecting pins 120 may also be provided which pin the joining pin to the working rod through apertures in each.

Referring to Figure 3, in an alternative embodiment, the slider 112 may include a guide 123 which provides a means to guide the joining pins in place. The joining pins may also if desired, be slidably engaged onto a guide 124, within the primary elongate section 102 and can be moved in a direction parallel to the longitudinal length of the working rod 122. A resilient means such as a spring 126 is located between the opposite end of joining pins 118 to the primary elongate section 102, and a protrusion 128 on the guide 123, such that in use the joining pin 118 may be forced against the spring 126 to disengage the joining pin 118 from the primary elongate section 102. Releasing the joining pin 118 results in the joining pin returning back to a position in which the slider is locked, provided the joining pin locates within an aperture 104 on the primary elongate section 102. A pin guide 124 may also be provided within the apertures of the main body for additional support as previously suggested. A further addition to the apparatus may be the slider comprising similar mounting features diametrically opposite to those described. This would result in working bars being mounted on either side of the primary elongate section 102.

Further slider mechanisms can be mounted onto the working rod 122 or primary elongate section 102 to build up the apparatus to the described shape and configuration for the exercise to be conducted. However, using these slider mechanisms results in only 90° angles between corresponding rods being erected.

Referring to Figure 4, there is a schematic side view of an addition to the apparatus allowing adjustable angled elongate section to be mounted to the exercise apparatus. Many clamping mechanisms are envisaged, however, in one simple embodiment, two discs 130 may be bolted to any elongate section on diametrically opposing points on the outer circumference of the elongate section, protruding from the elongate section. A further primary elongate section may then be clamped by a further bolt or grub screw or quick release mechanism to the inner faces of the discs. As an example, six bolt holes 132 are provided on the disc to allow for various angles to be achieved. It is therefore apparent that the modular nature of the present invention allows for many shapes and configurations of exercise apparatus to be constructed using few parts.

The exercise apparatus according to a further embodiment of the invention is shown generally as 1 in Figure 5. The apparatus comprises an upright 2 to which are connected two T-pieces 3a and 3b, at spaced positions along the length of the upright 2. The upright 2 has apertures 4 along sections of its length, the apertures being on opposed positions on either side of the upright 2. At one or both ends of the upright 2 there are end caps 5, which close off the ends of the upright and these are to be found in particular, attached to the upper ends of the upright 2, when in position. Also, approximately two-thirds along its length, there is a sectional break 6 in the upright. At this point it can be seen that the upright 2 comprises two parts, one part being held axially within the body of a second part of the upright such that one section of the upright can telescope with the other. This allows the upright 2 to be extended as required, for example if an individual is tall, the upright can be extended or shortened for individuals of lesser stature. It is also envisaged that a swivel joint may be provided at this point so that the portions of the upright can rotate relative to one another. Although one break 6 is shown in the figure, there may be various points at which the sections of the upright can telescope and/or swivel.

The lower T-section 3b, is connected to a cross member 7 which is push fitted within the portion of the T-section extending from the axis of the upright 2. The member 7 is held in the T-section by a bolt 9a, which passes through apertures in the T-section, which are aligned with apertures in the cross section 7. At the end of the cross section 7 distant from the end that is push fitted into the T-section 3b, there is a U-joint 8, which is secured to the cross section 7 by a further bolt 9b passing through aligned apertures in the U-joint 8 and the cross section 7. At a lower part of the U-joint is a further upright section 10 which is again push fitted into the U-joint and secured by bolt 9c passing through the U-joint and apertures in the upright 10. The upright 10 also has apertures along its length so that further sections can be secured to this upright as and when required.

At the lower portion of the first upright 2, there is a T-section 11 which is connected to a section 12 which is push fitted into the T-sections 11. The section 12, which extends outwardly from the axis of the upright is shorter than the section 7. At the end of the section that is distant from the part of the section 12, which is push fitted into the T-section 11, there is a clamp 13. This clamp has releasable securing members 14 which allow the clamp to be secured to a separate member, such as a bed, stool or a chair or possibly to a rail extending from a wall so that the exercise apparatus 1 can be held securely in an upright position when it is being used.

Figure 6 shows a further embodiment of the exercise apparatus, which comprises an upright 2, having an end cap 5 at its upper end, when in the upright position. There is a single T-joint 3b which is secured to the upright 2 and a cross member 7 is push fitted into and secured to the T-joint 3b by fixing means. At the end of the cross member 7, remote from the T-joint, there is a U-joint 8 which secures the cross member 7 to a second upright 10. The upright 10 also has a T-joint 16 positioned along its length and is secured in position as required passing a bolt 9b associated with the T-joint which secures it to the upright 10 through selected apertures 4b along the length of the upright 10. The T-joint 16 is itself secured to cross section 15 which can be orientated by way of the T-joint 16 being rotated about the axis of the upright 10 so the section 15 can be held in various about the axis of the upright and also, it can be positioned at desired points along the length of the upright 10 as required by an individual that is performing exercises. The individual can

either push against the cross section 15 using his or her arms, or with his or her legs or knees so that various muscle groups for the lower or upper body can be exercised by applying a force against the stationary cross section 15. By having a fixed piece of apparatus against which the individual applies a force, this allows an individual to exercise at his or her elected effort. The effort applied to the stationary force can vary over the exercise. For example, the individual can increase the effort applied with each push against section 15. However, when an individual carries out exercise, and they maintain their original position when a part of the apparatus is repositioned, there will be a variation in the exercise carried out because the muscles used by the individual will be different muscle groups due to the fact that the orientation of the cross section 15 is changed.

Figure 7 shows a further embodiment of the invention where there are uprights 2 and 10, which respectively are joined to cross sections 7 and 15 by way of T-joints. The section 7 is joined to the upright 10 by way of a U-joint, while the section 15 is connected to the upright 10 by way of a T-joint 16, positioned below the U-joint 8. The whole exercise apparatus assembly creates a substantially triangular exercise apparatus. An individual may sit between the two cross sections 7 and 15 and push against both sections so that arms or legs can be exercised by applying a force to the stationary sections. The uprights 2 and 17 can be moved relative to one another by loosening bolts which join the U-piece 8 and the T-section 16 to the cross members and cross members 7 and 15 can be splayed outwards or brought together and then the bolts secured into position on the U-member 8 and the T-section 15 so that the cross section 7 and 15 are held in different orientations. An individual can perform various exercises with the apparatus at a different orientation so that different muscle groups can be exercised, also, by allowing the apparatus to be re-orientated, the individual can adapt the apparatus to suit his or her physical dimensions. As a matter of safety ideally there are no hard edges that could come into contact and cut or bruise an individual, so uprights 2 and 17 have respectively end caps 5a and 5b.

The end caps can have markings or instructions on them showing the individual which hand to place in which position for exercising various muscle groups. For example, an end cap can indicate that an individual should be positioned so they faced the U-section so that certain muscle groups are exercised when the individual pushes out against the cross

section 7 and 15 or alternatively, the individual could have his or her back to the U-section for exercising different muscle groups.

Figure 8 shows a further embodiment of a slider unit, which can be attached to any one or more of an upright or auxiliary section of the apparatus. The slider unit consists of a cross arm 20 which can be push fitted into the portion 19 of a T-piece joint 3a that extends from the axis of the main portion of the T-section attached to the upright 2. Extending parallel to the arm 20, there is a bar 26. The arm 20 is secured within the portion 19 of the T-piece by bolt 25, said bolt also securing one end of the bar 26 to the arm 20. Optionally, there may be one or more additional support bolts 25, to give more strength, stability and/or rigidity to the structure when in use. At the other end of the bar 26, there is a handle portion 22, which extends axially around the arm 20, so that the handle can slide along the arm. The arm 20 has apertures 21, as does the handle 22. Although the bar 26 is shown as an elongate element, it may be in the form of an arcuate part, extending partially around the circumference of the arm 20 or indeed it may encircle the arm in particular may provide a protective shield over the area where the arm 22 and bar 20 meet, so reducing the risk of an individual trapping fingers between the moving parts of the slider unit. The bar has a pin 23 extending through it, which may be positioned in apertures in the handle 22, which are aligned with those in the arm 20. This allows for the telescoping section 20 and 22 to be moved axially relative to one another. When the desired length is reached, the pin 23 can be pushed through the handle 22 and the section 20 to orientate the arm in the desired position along the length of section 20. A user of the exercise apparatus can then grip the handle 22 at a particular position and carry out exercises when the bar is in this orientation. The handle 22 is attached to an end stop 29 which can either be positioned to a further upright or can be4 in the form of a bar mounted on the end the handle. There is a spring 27 attached to the stop 29. The spring forms a resilient member which allows the handle 22 to be easily pushed along the length of the arm 20 so that it can be more easily moved so that corresponding apertures in the arm and handle are brought into so that pin 23 can drop or be pushed into position so that the arm and handle are held in a particular position prior to exercise being carried out.

Figure 9 shows a further embodiment of the invention where there is an exercise apparatus having an upright 31. Positioned along the length of the upright 31 there is a cross member 33 which passes through the upright and at either end of the cross member 33 has extending section 34 substantially at right angles to the cross section 33. At right angles to the extending section 34 there is a handle section 35 which can be gripped by an individual using the apparatus. Orientation of the section 34 along the cross section 33 can be altered by using sections, such as the connectors shown in Figure 4, which has a spring 37 and a stop member 36, which allows the extending portion 34 to be moved along the length of the cross section 33 as required by an individual. For example an individual with broader shoulders may want the arm to be at a further distance along the length of the cross section 33 than someone who has less broad shoulders.

The upright 31 is secured by push fitting into an aperture in a cross member 38 of a supporting base for the upright. The cross member 38 forms a seat for an individual so that they can position themselves relative to the upright when using the exercise apparatus. The seat 38 is secured to a least two upright members 39 which again can be telescoping so allowing the height of the exercise apparatus to be adjusted according to an individual's requirements. There are cross members 40 and 41, which extend between uprights 39 and these provide strength and stability. Further, they also provide a surface of the apparatus against which the legs of the individual can purchase so that further exercises can be carried out, for example on the thighs or calf muscles while an individual is exercising his or her upper body portion using the cross member 33 and arm portions 34 and 35. Cross members 41 and 40 can be positioned at various positions along the length of the uprights 39 by way of pushing the cross members through apertures in the uprights 39 by way of securing them in apertures along the length of the uprights. The uprights and cross member can be secured by T-pieces or simply by pushing through apertures and securing with a fixing means passing through the upright and cross member such as a bolt.

Figure 10 shows yet a further embodiment, which operates on the same principle to the apparatus shown in Figure 9, except in this embodiment, the support for the parts is displaced about an axis of rotation moved by an angle of 90°.

The apparatus comprises an upright 2 attached to a cross member 7 by a support element 3. Although not shown, the cross member can be attached to one or more further uprights. Apertures in the upright allow for fixing of the support element 3 at various heights, according to the stature of the person using the apparatus.

A plate 58 is attached by a plate support 57 on the cross member 7, cross member 33, 37 extends substantially at right angles form the plate 58. The cross members can be provided as separate units and supported by the plate 58, or as one unit, which extends through the plate 58. Grips 34a, 34b extend at an angle, preferably at an angle of 30° to 45° from respective cross members 33, 37. The grips are supported towards the ends of the cross members which are, removed from the plate 58 and are held on the cross members by twisting or swivel fixings that allow the grips to be moved relative a respective cross member on which grips are attached. There is a cross pin 56a, 56b which runs substantially parallel to the respective cross member and these are releasably connected at one end to respective grips 34a, 34b. The opposite end(s) of the pins can be releasably secured to fixing points 59 on the plate. The fixing points can be apertures in the plate into which the end of each pin 56a, 56b is inserted or releasable fixings such as clips that can hold the ends of the pins. The arms 33, 37 can be swivelled the longitudinal axis of the arm(s). This movement allows the pins 56a, 56b to be fixed at a required position by securing at a fixing point in the plate 58. By placing the cross members and grips at various orientations, the user exercises different muscle groups, either on their legs or arms because of the differences in orientation of the apparatus relative to the user. The advantage of having a dismantle-able and reposition-able apparatus is that the user can carry out exercises in accordance with his or her requirements.

An additional modular component or the present invention is the further embodiment that allows for rotational movement of the exercise apparatus. In this embodiment, a rotating disc, through which electricity is passed, rotates between a permanent magnet resulting in the occurrence of Eddy currents. As a user rotates the disc at greater speeds, the resistence forces are increased due to the increased currents produced. Figure 11 shows an end view of an exemplary embodiment of the arrangement, of which the disc can be mounted onto

the arm 33. Opposing polarity magnets are provided on opposing sides of the disc, with an electricity supply being passed through the disc at diametrically opposite locations.

Figure 12 shows an alternative embodiment of the invention where there is an upright 42 which can telescope within a lower section 45, which is secured to a cross member 46 forming part of a base section for the apparatus device. Towards the upper portion of the upright 42 there is a T-piece 43 which is secured to cross member 47 extending at an angle preferably a 90° angle from the axis of the upright. The cross member 47 is push fitted into the T-joint 43 and secured by a pin 44 passing through the T-joint and the cross member 47. The lower portion 45 of the upright 42 has a shorter cross member 48, which is substantially at right angles to the axis of the lower portion 45. At the end of the cross member 48 remote from the lower portion adjoining the upright 45 there is a connecting member 49 substantially at right angles to the axis of the cross member 48 which itself is secured to a handle 50. The handle 50 is substantially parallel to the axis of the cross member 48. However, the handle 50 can, by way of connecting section 49 rotate about the axial length of the member 48. Handle 50 can be locked at various positions by a pin mechanism.

There are four uprights 55 each being joined at their top portion by T-joints 52, which are in turn connected to cross members 51. The T-joints are joined to the cross members by bolts 53. At the lower portion of the uprights 55 there is a similar corresponding arrangement with lower cross members 54. The whole arrangement forms a box-like arrangement, which supports the uprights 45, 42. An individual can sit on cross members 51 in any orientation relative to the upright and can grasp handle 50 or cross member 47 and push against these fixed members to carry out exercises. Not only can the cross members 47 and the handles 50 be orientated at different positions relative to the upright, which itself can rotate about its axis but the individual can position him or herself at various positions on the base portion to carry out exercises or various muscle groups. Indeed, an individual can use the handle 50 as a backrest and simply push on the upper cross member 47 to carry out upper body exercises while maintaining a substantially upright position, with the back being supported by handle portion 50. If the individual

turns around, they could rest their midriff against the handle portion 50 while pulling or pushing on the cross member 47.

As can be seen from the various embodiments shown, there are many different ways that the apparatus can be used making it particularly adaptable for use in the home, the office or for example in a hospital environment such as where an individual is being exercised in a physiotherapy unit or if they are being exercised in bed for they are for example paralysed to some degree.

The apparatus being demountable is not only space saving because it can be dismantled and stored easily and quickly, but further sections can be purchased to expand the apparatus if required which produces the initial outlaying costs for buying the apparatus. Further, by using apparatus which not only allows for isometric exercise but also allows for a degree of dynamic exercise by allowing for re-positioning of parts of the apparatus, then an individual can carry out different forms of exercise, rather than known exercise apparatus where only one type of exercise, for example, isotonic or isometric exercises are carried out. Further, because the individual is always pushing against a fixed load, then the exercise is driven by the own efforts of the individual. This can be contrasted with known techniques where an individual has to exercise within limits that are defined by the apparatus, for example, if weights are lifted, the defined limit is the weight used. If the individual cannot attain the limits which are required for the easiest type of exercise to be formed on the known apparatus, then they still cannot exercise. The apparatus for the present invention allows an individual to position the apparatus so that they can operate the apparatus at their lowest capacity but also the apparatus can be adjusted so that as an individual gains strength, then the exercise can be made more taxing for that individual by re-positioning of the apparatus but as the exercise will still depend on the individual's own efforts, then the degree of exercise will still remain within the individual's capability.

The apparatus may be operated with an integral timer which will operate an alarm when an individual has been providing a force against the apparatus for a set time limit, for example, six to ten minutes, although exercise can be carried out for longer time periods although it is recommended that no more than four sessions should be used in any one

position. Alternatively, an individual may devise a set routine of exercises that they carry out in sequence, possibly under timed conditions.

It is important in exercising to maintain an individual with a substantially straight spinal column so that his or her back is not put under undue strain. By having the exercise apparatus arranged so that it can be only orientated in certain defined positions dictated by the sections and joints, then this contributes to the individual maintaining this upright position. Further the apparatus allows for even exercising of the body because an individual can exercise against the fixed position of the apparatus in both a forward and reverse direction so allowing an increased range of exercises to be carried out.

It is to be understood that the above detailed description is an embodiment of the invention and is provided by way of example only. Various details of the invention may be modified without departure from the true spirit and scope of the invention. As an example, it is envisaged that the apparatus may be automated such that the orientation and position of relative sections may be altered automatically according to a programmed sequence.